

Amendments to the Specification:

Please replace paragraph [0037] as follows:

[0037] The procedure for showing in practice this spectral contribution of the underlying microseismic signals is as follows.

Notations :

- $f_{i,n}$ designates the fundamental frequency emitted by source i during the recording n (this frequency is independent of the cycle),

In order to simplify the notations of the following quantities, the subscript giving the number of the receiver is left out. Whatever this number, the quantities are calculated in the same way.

- $R_{p,n}$ designates the recording of rank n of cycle p ,
- $C_{p,i,n}$ - $C_{p,i,n}$ the contribution of source i to the recording n of cycle p ,
- $M_{p,n}$ the initial model of the active part of the recording n of cycle p . This model contains only the frequencies emitted and their harmonics during recording n ,
- $E_{p,n}$ the ratio between the active contributions of the recording n of cycle p and the initial model of the active part of the recording n of cycle p ,
- $A_{p,n}$ the active part of the recording n of cycle p ,
- $P_{p,n}$ the passive part of the recording n of cycle p (microseismic),
- k the differences updating coefficient (typically of the order of 15 to 25 %),
- h the models updating coefficient (typically of the order of 5 to 10 %).

Please replace paragraphs [0038] – [0044] as follows:

[0038] Considering these notations, the method first consists, for each recording n of cycle p , in calculating the respective contributions $G_{p,i,n}$ and $C_{p,i,n}$ of the various sources at their fundamental frequencies and at their harmonics by means of the method described in the aforementioned French patent 2,805,051. Owing to the possible presence of microseismic energy, the contribution of the various sources is likely to be affected by noise.

[0039] This estimation can be improved by associating the contributions of all the receivers of a same recording $G_{p,i,n}$ and $C_{p,i,n}$. These contributions can be considered to be the product of two factors among which one depends only on the source (and not on the receiver) and the other on the receiver, and not on the source.

[0040] If subscript r represents the receiver,

$$G_{p,i,n,r} = S_{p,i,n} T_{p,i,n,r}$$

$$C_{p,i,n,r} = S_{p,i,n} T_{p,i,n,r}$$

T only depends on p , i and n by the variation of the characteristics of the receiver and of its environment with time. These variations are very slow and can be disregarded or estimated more precisely.

[0041] S and T are determined to within one factor. The average of the downgoing waves can thus be selected for $S_{p,i,n}$ and $C_{p,i,n}$. This average is obtained by means of a calculation well-known in VSP processing (flattening of the downgoing waves and average). The $T_{p,i,n,r}$ and $T_{p,i,n,r}$ are then the transfer functions between the downgoing wave and the seismogram.

[0042] In cases where the variation of T is to be taken into account, updating coefficient h can for example be used to update $T_{p,i,n,r}$ from $T_{p,i,n-1,r}$ as follows :

[0043] If $Co_{p,i,n,r}$ designates the initial estimation of contribution C and $To_{p,i,n,r}$ that of the receiver factor, S is calculated by flattening and averaging of the downgoing waves, then $To_{p,i,n,r}$ is calculated by the relation :

$$To_{p,i,n,r} = \frac{Co_{p,i,n}}{S_{p,i,n}}$$

[0044] The final estimation of the receiver factor is obtained by :

$$T_{p,i,n,r} = (1-h)T_{p,i,n-1,r} + hTo_{p,i,n,r}$$

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and the final contribution of source i to cycle p of recording n by :

$$C_{p,i,n,r} = S_{p,i,n} T_{p,i,n,r}$$

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Then the ratio $E_{p,n}$ of the current recording to the spectral model by the relation is calculated:

$$E_{p,n} = (1-k)E_{p,n-1} + k \frac{\sum C_{p,i,n}}{M_{p,n}}$$

Please replace paragraph [0049] as follows:

[0049] The respective spectral contributions $G_{p,i,n}$ - $C_{p,i,n}$ of each source S_i at the fundamental frequencies and their harmonics, after completion of a cycle of measurements, provide, by inverse FFT, the seismograms (in the time domain) used within the context of active exploitation.

Please replace paragraph [0052] as follows:

[0052] The interest of these updatings is to optimize estimation of the active signal when its variations cannot be controlled (seasonal and daily variations). In the most ~~favourable~~-favorable cases, they are not necessary and estimation of the active part amounts to the initial model.